

Application S/N 10/785,365
Amendment/Response Dated April 4, 2007
Reply to Office Action Mailed on October 4, 2007

REMARKS/ARGUMENTS

Priority

1. Applicant acknowledges priority to provisional application 60/449,623 filed on 02/24/2003.

In the Specification

2. Applicant has amended the title of this application to read “PROVIDING A HIGH SPEED DATA MODEM BASED ON MIMO TECHNOLOGY USING A CABLE OR SINGLE ANTENNA.” No other paragraphs have been amended in the specification to clarify previously disclosed matter and/or correct language, reference labeling, figure description, and/or syntax. No new matter has been added.

In the Claims

Regarding the Claim Rejections under 35 U.S.C. 112

3. Claims 1-37 are pending in this application. Claims 1-37 have been rejected under the second paragraph of 35 U.S.C. 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. In particular, the Applicant mentions that user interfaces transmit data at “high transfer rates” which did not have specific meaning within the claims as originally filed. Applicant agrees, and in response, Applicant has amended claims 2, 14, 26, and 37 to point out that the meaning of high transfer rates in this application is within the range of 500 kbit/sec and 1.5 Gbit/sec. This high transfer rate range is fully supported by the specification in paragraphs [0131] through [0139], please see. Additionally, these rates of data transfer would be considered “high” and the modems operating at these speeds “fast” by someone skilled in the art, given the applications pointed out by Applicant in the specification in paragraphs [0129] through [0142].

Regarding the Claim Rejections under 35 U.S.C. 103

4. Claims 1, 6-11, 25, and 30-35 were rejected under 35 U.S.C. 103(a) as being unpatentable over Shattil (Publication No. 2003/0147655) in view of Silva et al. (Publication No. 2004/0224637).

In response, Applicant has amended claims 1, 2, 5, 13, 14, 17, 25, 26, 29, and 37. In particular, Applicant has amended independent claims 1, 13, 25 and 37 to more clearly define and particularly point out Applicant's invention. Claims 5-12 depend from claim 1, claims 17-24 depend from claim 13, and claims 30-36 depend from claim 25. Claims 3, 4, 15, 16, 27, and 28 have been cancelled.

Here independent claims 1 and 25 have been rejected by a combination of Shattil and Silva, et al. Claim 1 has been amended herein to include the limitations previously in claims 2, 3 and 4. Likewise, claim 25 has been amended herein to include the limitations previously in claims 26, 27 and 28.

Applicant earnestly believes that this combination of novel elements is not found in the combination of Shattil and Silva et al. The present invention has the following characteristics not found in the cited references:

- (a) For a MIMO space-time environment to obtain the said claimed gain in data transfer rate, it requires antenna independence (both on the transmitter and receiver side) to prevent the eigenvector of the channel signature matrix from zeroing out;
- (b) Antenna independence in the present invention behaves in a similar way to stereo separation in a common household stereo system and/or stereoscopic vision;
- (c) stereo audio-phonic information can be transmitted over a single antenna (for example, all vehicle stereo systems), therefore, the same rules and laws of physics that apply to a wireless stereo relay system should apply to a MIMO space-time system;

- (d) the antenna reduction chamber mimics the environment of a stereo audio recording studio (transmitter side) and of a home theater system (receiver side), respectively;
- (e) therefore, the present invention allows transmitting MIMO space-time signals on a single antenna, but not reception on a single antenna, the difference being that noise adds at the receiver input; and
- (f) perhaps most importantly, the antenna reduction chamber can be simulated mathematically in a DSP, which is novel with respect to the references cited.

One of the most important elements included in the present invention is the antenna reduction chamber. The Examiner has stated that Shattil recites this feature in **Fig. 4C** as reference character **470**. Applicant disagrees. This feature as disclosed by Shattil is not an antenna reduction chamber and it is nowhere described as such. In fact, Applicant fails to find any mention of **470** in the entire specification of Shattil, and, there is no mention of any antenna reduction chamber throughout the specification. Finally, a reading of the specification (see paragraph **[0118]** and the relevant claims) reveals that this invention emphasizes a plurality of mixers **425n** and a plurality of antenna array elements **424n**, and completely fails to teach, disclose or claim, even remotely, anything related to an antenna reduction chamber or a single antenna modem system. The Shattil reference is not even in the same class of invention as the present application. Since the Shattil reference is at the heart of the Examiner's argument for rejecting claims 1, 13, 25 and 37, and since Shattil essentially fails to support the novel feature of an antenna reduction chamber being an element of a single antenna modem system, the Examiner's argument must necessarily fail to support rejection of the independent claims as amended herein.

Therefore, for the foregoing reasons, Applicant strongly believes that independent claims 1, 13, 25 and 37 include limitations not previously disclosed or taught by any of the cited references, whether taken alone or in combination.

5. Claims 13, 18-23, and 37 were rejected under 35 U.S.C. 103(a) as being unpatentable over Shattil (Publication No. 2003/0147655) in view of Silva et al. (Publication No. 2004/0224637) and further in view of Sew (Publication No. 2004/0030868).

Here independent claims 13 and 37 have been rejected by a combination of Shattil, Silva et al. and Sew. Independent claims 13 and 37 have been amended as described above. For the foregoing reasons, Applicant believes that claims 13 and 37 are in condition for allowance. Since claims 18-23 depend from claim 13, claims 18-23 should also be in condition for allowance. Such action by the Examiner is respectfully requested.

6. Claims 2-5 and 26-29 were rejected under 35 U.S.C. 103(a) as being unpatentable over Shattil (Publication No. 2003/0147655) in view of Silva et al. (Publication No. 2004/0224637) and further in view of Watanabe (US Pat. No. 6,731,602).

Here claims 2-5 and 26-29 have been rejected by a combination of Shattil, Silva et al. and Watanabe. Claims 2, 26 and 29 have been amended herein, and claims 3, 4, 27 and 28 have been cancelled. Applicant believes that claim 1 and 25 are now in condition for allowance, and since claims 2 and 5 are dependent from claim 1, and claims 26 and 29 are dependent from claim 25, these claims too should now be in condition for allowance. Such action by the Examiner is respectfully requested.

7. Claims 12 and 36 were rejected under 35 U.S.C. 103(a) as being unpatentable over Shattil (Publication No. 2003/0147655) in view of Silva et al. (Publication No. 2004/0224637) and further in view of Binder (Publication No. 2006/0209847).

Independent claims 1 and 25 have been amended herein to include limitations not disclosed or taught in the references cited, and Applicant now believes that these independent claims are in condition for allowance. Since claim 12 depends from claim 1, and claim 36 depends from claim 25, these claims too should then be in condition for allowance. Such action by the Examiner is respectfully requested.

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8. Claims 14-17 were rejected under 35 U.S.C. 103(a) as being unpatentable over Shattil (Publication No. 2003/0147655) in view of Silva et al. (Publication No. 2004/0224637) and further in view of Sew (Publication No. 2004/0030868) and further in view of Watanabe (US Pat. No. 6,731,602).

In response, Applicant has amended claims 14 and 17, and has cancelled claims 15 and 16. Moreover, since remaining amended claims 14 and 17 depend from claim 13, and Applicant believes that claim 13 as amended is in condition for allowance, claims 14 and 17 should likewise be in condition for allowance. Such action by the Examiner is respectfully requested.

9. Claim 24 was rejected under 35 U.S.C. 103(a) as being unpatentable over Shattil (Publication No. 2003/0147655) in view of Silva et al. (Publication No. 2004/0224637) and further in view of Sew (Publication No. 2004/0030868) and further in view of Binder (Publication No. 2006/0209847).

Claim 24 depends from independent claim 13. Applicant believes that claim 13, as amended herein, is now in condition for allowance and therefore, claim 24 should be likewise presently in condition for allowance. Such action by the Examiner is respectfully requested.

10. Applicant acknowledges that the prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

CONCLUSION

All of the objections and rejections raised by the Examiner have been addressed by Applicant. Attorney for Applicant has carefully reviewed the cited references, namely the Shattil, Silva et al., Sew and Binder US patent application publications and the Watanabe patent, and believes that the new claims presently on file in the subject application are patentably distinguishable with respect to the prior art. In view of the amendments to the claims and the

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remarks submitted herein, Applicant submits that all of the new claims of record are in condition for allowance and respectfully requests that a Notice of Allowance be issued in this case in due course.

If it is felt for any reason that direct communication with Applicant's attorney would serve to advance prosecution of this application to allowance, the Examiner is invited to contact the undersigned, attorney of record in this case, Richard D. Clarke, Esq., at one of the listed below numbers or at his below listed e-mail address.

Dated: October 4, 2007

Respectfully Submitted,

LAW OFFICE OF RICHARD D. CLARKE

By Richard D. Clarke

Richard D. Clarke

Patent Attorney for Applicant

USPTO Reg. No. 38,846

Customer No. 22890

Richard D. Clarke
Law Office of Richard D. Clarke
3755 Avocado Blvd., #1000
La Mesa, CA 91941-7301

Telephone: 619-670-1702
Facsimile: 619-670-7585
Email: rclarkeesq@sbcglobal.net